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ABSTRACT

The problems of the education of the aurally handicapped were discussed in speeches presented at the convention of the Council for Exceptional Children in Chicago, 1970. Papers reported include a suggested approach to the evaluation of expressive oral syntactic competence of the aurally handicapped child by Jean Lehman, the language of children receiving aural linguistic input by Helen Golf, and implications of the linguistic approach for the classroom teacher by Jean Moog. (JM)

The Hearing Impaired

Papers Presented at the

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The Council for Exceptional Children

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A SUGGESTED APPROACH TO THE EVALUATION OF EXPRESSIVE ORAL SYNTACTIC COMPETENCE OF THE HEARING IMPAIRED CHILD

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The prime concern of the educator of the hearing impaired child is that of language acquisition and language growth. Yet, our research efforts have been more or less undefined in an attempt to respond to that responsibility. Linguistic procedures have been focused on the deficits caused by the auditory impairment rather than on the capacities of the child. Instructural techniques have been founded on the belief that the so-called "deaf" child is different from the hearing child, and therefore, the procedures used in the educational program must be different. Fortunately, from researchers in ancillary disciplines, revolutionary changes are taking place in the education of the hearing impaired child. (And, in the opinion of the writer, the investigators, for example in the areas of child development and psycholinguistics as well as the educators of the hearing impaired, will reap mutual benefits.) Linguists have provided us with the developmental sequences of the natural acquisition of language. Is it not right to assume that the hearing impaired child's language develops likewise?

Evaluation materials have attempted to measure deficits in the visual and auditory receptive systems; in the vocal or nonvocal behavior; in the relation between the receptive and expressive processes.

There is increasing agreement among educators of the hearing impaired with those of the normally hearing, as to the best way to approach linguistic comprehension, competence, performance and production. Assuming that the child's comprehension precedes production; that competence is the knowledge of the linguistic rules; that performance is the expression of competence in talking and listening, and involves memory and time; that production and comprehension of speech are both categories of linguistic performance, and both involve the expression of competence (one in producing speech, the other in receiving speech); and that grammar is a statement of

competence (1), the research efforts of Lee (2), Menyuk (3), Elliott-Hirsh-Simmons (4), Shriner (5, 6), Miner (7), Povich and Baratz (8), and many others have contributed both guidelines and results to aid in the attempt to establish procedures to be used in the evaluation of language competence of the hearing impaired child.

Reasons for Evaluation of Language Competence

Some of the reasons for evaluation of language competence are as follows:

1. To utilize and apply the psycholinguist's knowledge pertaining to the language development of the hearing child (the sentence structure, complexity, and length, the developmental steps or sequences) and apply this knowledge in shaping the language behavior of the hearing impaired.

2. To make decisions concerning the teaching of language.

3. To describe the syntactic level at which the child is functioning in order to determine, and focus on, the successive sequential steps for linguistic input and expectancy.

4. To modify crucial aspects of the child's language in order to more nearly match those of "normal" members of the community (9).

The teacher must be able to describe the linguistic behavior of each child, know how language learning takes place, have knowledge of what the normal child is using at various stages and view the child's behavior in terms of the levels of functioning input and output modalities and representational and automatic levels of behavior (10).

Inspection of the linguistic analysis should reveal many implications for therapy. For example, it would be important to identify those generative rules which are restricted to a child's grammar, those utterances which are considered ungrammatical by adult English standards. Possibly such utterances might be modified into adult grammatical rules by operant procedures. Furthermore, the list of NP and VP constructions can be viewed as a very tentative hierarchy of developmental levels for that child. It would be helpful to know which grammatical rules a child possesses before attempting to expand his verbal maturity (7).

Previous Studies Involving Analyses

Menyuk's study (3) contributed a transformational model which allowed for the description of rules for generating sentences from the stage at which a simple-active-declarative sentence is formulated from the parts of speech (the phrase structure), to the level at which the sentence is

changed to other types (the transformational level) to the final level at which inflectional rules are applied (the morphological level).

Lee's Developmental Sentence Types (2) provided "a theoretical construct of early syntactic development in children's language. Beginning with the simplest two-word combinations, this construct traces the gradual emergence of phrase structure rules in children's grammar and the formulation of kernel sentences, from which transformational structures can be derived". (p. 329)

Povich and Baratz (8) in their study of lower class Negro children in a Head Start program, used Lee's Developmental Sentence Types and Menyuk's list of transformations and restricted forms as analytic tools for analyzing the linguistic usage of the children.

Brannon (11) compared three-year olds and four-year olds in the usage of 26 syntactic transformations (Menyuk's list). Sixty utterances were elicited and recorded in written form during free play, taped responses to colored slides and a story. Results showed that children seem to mature in language competence by acquiring syntactic rules according to phrase structure, simple transformations, to generalized transformations.

Miner (7) reports a new language measure, the length-complexity index (LCI) and the procedures involved in scoring of the scale, which provides information regarding both morphological and syntactic features of child language. He considers the length-complexity index (LCI) superior to that of the mean length of response (MLR) or the structural complexity score (SCS) which were previously developed and used.

The Northwestern Syntax Screening Test (12) which has recently been developed by Lee and others is probably the most useful screening instrument for measuring receptive and expressive use of syntactic forms by young normally hearing children.

Hardy, Pauls, and Haskins (13) in a very comprehensive study compared groups of hearing impaired and normally hearing children in order to determine possible relationships between hearing impairment and details of language development. In one aspect of the testing procedure the children were shown complex action pictures and a page of animal pictures and asked to tell about them. They were also asked to tell the story of a familiar child-classic. Among other analyses was the type-token overall and terms of syntactical structure.. An interesting comment of the authors resulting from this research done more than twelve years ago, is that "language-learning and use involve broad, rather than narrow, syntactical forms complete with connectives and modifiers. It is the achievement of fluency with the total, purposive sentence, rather than the individual word, that is the more debased or restricted by the fact of hearing impairment...the training of the hearing impaired children should be centered on the fuller

language forms of the phrase and the sentence, instead of the word. It is the reflexive level of putting words together that the hearing impaired child needs most help". (p. 26)

Brannon and Murry (14) compared groups of hearing and hearing impaired in oral response to colored pictures, as well as written response, on the basis of three or four sentences. The responses were evaluated according to Myklebust's Picture Story Language Test technique. They reported that as the hearing loss increased the child's ability to communicate orally decreased. Although the deaf were inferior in structural accuracy, they were not inferior in productivity; however, the deaf began and ended their sentences with relatively few errors compared to a large number of errors occurring in the middle. The deaf also tended to use kernel sentences more than transformations.

The Elliott, Hirsh and Simmons study (4) describes the verbal descriptions of pictures by young children with normal or impaired hearing. Evaluation was both by ratings and by certain objective scores.

Considerations and Variables

Considerations relative to an objective evaluation of expressive oral syntactic competence of the hearing impaired child might include the following variables:

1. Choice of stimuli
2. Procedure for presentation of stimuli
3. Method of recording
4. Observer-Recorder
5. Length of response
6. Duration of response
7. Utterances
8. Pauses (phrases)
9. Intelligible words (tokens)
10. Intelligible different words (types)
11. Type-Token ratio
12. Mean Length of Response (MLR)
13. Structure Complexity of Response Index (SCRI)

The sample of oral language exhibited at the time of recording may not be commensurate with the individual's best language usage because it has been found that children are not consistent in this respect from day to day. (15) This discrepancy is applicable to most measures of language output. Yet, it cannot be assumed that an attempt to arrive at an approximate level of linguistic competence is not of value.

Although the importance of the consideration of morphological inflections is recognized, they are not included in the present evaluation procedures.

1. Choice of Stimuli

The fact that the choice of stimuli effects the response is a foregone conclusion. A picture or pictures depicting individuals and activities commensurate with the chosen group's interests and experiences is important. Different stimuli obviously would be used for the "practice" and "test" periods. If a cumulative record were to be compiled for purposes of comparable linguistic growth it would seem pertinent that the stimuli remain constant for "test" purposes and be used only at the time of the evaluation recording.

2. Procedure for presentation of stimuli

Differences in procedure used by the examiner in eliciting spontaneous speech samples will probably affect the results obtained from the normally hearing child. For example, "Tell me a story about the picture" may evoke a different response than "Tell me what they are doing in the picture" or "Tell me what you see in the picture". For the young hearing impaired child the directions given at the time of presentation of the stimuli are not so important as are the procedures established during the necessary "practice" periods prior to the time of the actual recording. (See Consideration 1)

3. Type of Recording Equipment to be used

Either video-tape or audio-tape recording equipment is satisfactory media for this type of stimuli presentation to the young hearing impaired child. However, the former is considered the better for obvious reasons. Either media provides a permanent record and provides for repeated viewings, and allows for changes over time. "As we progress from observations in natural situations to instrumental recording, the sample becomes increasingly more restricted, but the data become more precise and replicable." (9)

4. Observer-Recorder

The recorded language sample might be viewed by the teacher and/or others who are familiar with the speech of a hearing impaired child, or by observers who do not possess that skill. If a group of observers is involved, a consensus of their recordings is then necessary.

5. Length of Response

Investigators have used 50 sentences, 40 sentences, 15 sentences, and so on. The higher the number of responses, the higher the reliability. In an attempt to determine how large a sample of children's connected speech must be elicited in order to obtain reasonably reliable scores representative of average length and structural complexity of linguistic utterances, Darley and Moll (16)

concluded that the MLR scores based on 50 responses are of adequate reliability for most research purposes; however, the reliability of the SCS values based on 50 responses may represent less precision than is desired in some situations.

In spite of this information, it is not possible to elicit an "adequate" number of responses from a child with deviant language, especially a very young hearing impaired child. In view of an "inadequate" number of responses, it would seem both reasonable and sensible to provide sufficient motivation to encourage the child to speak without setting a time limit. (Unless he is very verbose he will undoubtedly set his own limits.)

6. Duration of response

Time is measured directly from the video-tape or audio-tape with a stop-watch. The duration of the response is thought to begin at the time the child is shown the picture and terminates when he has ceased talking.

7. Utterances

Utterances are considered to be pre-language vocalizations in the case of the child whose speech is unintelligible. "Speech" may be a rapid flow of intonated jargon together with attempts to articulate. In the case of the child who has some intelligible speech the record is made in the same manner. For example, - - -, -, - - - - -, would be interpreted as nine utterances and three pauses. Although the relation between these vocalizations and subsequent intelligible speech is undetermined, the apparent relation cannot be ignored. (This record might also be made in terms of the prosody of the language which is thought to be basic to the learning of syntax.) The number of utterances can be divided by the time in order to obtain the number of utterances used per minute.

8. Pauses

The number of pauses is recorded as above. It might be assumed that the pauses indicate the child's initial attempts to phrase his message. The number of phrases per minute can be determined.

9. Intelligible Words (Tokens)

The intelligible words are recorded and later counted. The number of intelligible words per minute can be determined.

10. Different Words (Types)

From the list of intelligible words, the different words are recorded and a count made thereof. The number of intelligiole different words per minute can be determined.

11. Type-Token Ratio

The type-token ratio is determined by dividing the total number of different words by the total number of words.

12. Mean Length of Response (MLR)

The mean length of response is determined by computing the average, or the number of words per response averaged over the number of responses in the language sample. The higher the number of responses, the higher will be the reliability.

Smith (17) found the following mean sentence lengths for the chronological age groups indicated below:

C. A.	Sentence Length	
2-0	1.7	(Words were about 65% intelligible.)
2-6	2.4	
3-0	3.3	(Words were about 70 - 80% intelligible in context.)
3-6	4.0	(Some trouble with sentence structure)
4-0	4.3	
5-0	4.6	

Brown and Bellugi (18) state that the best single index of speech development is the average length of utterance.

Shipley, et al. (19) ranked children according to "verbal maturity" and rated their natural speech samples by median utterance length:

Mature group used 2.5 to 3.5 words.
Intermediate group used 1.4 to 1.85 words.
Immature group used 1.06 to 1.16 words.

Menyuk (3) stated that increased utterance length was dependent on retention span and a clue to language acquisition; that as the memory span increases, longer and longer sentences occur, but without adding to the basic structures used.

Shriner and Sherman (5) used MLR and outside criterion and suggested that the MLR was deleted as a predictor variable on the basis that it correlated highly with other retained predictors. But they concluded that "if a single measure is to be used for assessment of language development, MLR would appear to be the most useful among those studied", but that it was not a good predictor for children over five years of age. (Normally hearing children with "normal" language development.) They considered the best predictor to be length-complexity index (LCI), yet the LCI and MLR correlated highly. (MLR provides relatively scant

information about morphological and syntactic developmental changes which occur with age, and does not directly assess growth of syntax and lexicon.) (6)

Gerber and Hertel (20) compared culturally advantaged and disadvantaged preschool children with respect to certain measures of linguistic maturity or competence. Results indicated that the mean length of utterance (MLU) was the only language measure which was sensitive to sex differences as well as cultural differences. (The "advantaged" used a mean of 4.84 words per utterance; the "disadvantaged", 3.47 words per utterance.)

13. Structure Complexity Response Index (SCRI)

Menyuk (21) noted that sentence complexity relates to more than sentence length; it is also a function of the ability to apply increased differentiated rules for generating grammar. She further states that the child incorporates both the generative rules of grammar and the heuristic component that samples an input sentence, and by a series of successive approximations determines which rules were used to generate this sentence.

She theorizes that the child's linguistic development progresses from the phrase structure to the kernel sentence to more complex sentence types--the single and double-base T's--through rules for addition and/or deletion, permutation, and substitution within or among the kernel sentences. (Following this phase comes that of the morphological aspect of language which involves the inflectional rules.)

Miner (7) developed a length-complexity index (LCI) which is a measure of language designed to facilitate a composite analysis of sentence length and sentence complexity. A numeric weighting scale was developed to assess the developmental changes in the child's language for the purpose of describing the rules of grammar which the child employs in generating sentences. The LCI score is the sum of the child's noun phrase (NP) points added to the verb phrase (VP) points added to other structural (additional) points (AP) for each sentence, divided by the number of sentences (NS) used.

$$LCI = \frac{NP + VP + AP}{NS}$$

To quote Menyuk (22) again: "Parceling out various aspects of the grammar for description, in all likelihood distorts the picture of grammatical development since all aspects of the grammar are interdependent.... Choosing to describe the syntactic structures being used by children throughout the developmental period seems to be a logical beginning, however, since it has been postulated that it is the derived deep structures of the string that is phonologically interpreted and the transformed structure of the string that is phonologically interpreted." (p. 17)

As a result of the studies prior to 1967 together with Menyuk's (3) and Lee's (2), the writer in 1967 began to study the feasibility of adapting the use of a syntactic scale to the education of the hearing impaired child. And since the majority of in-service and prospective teachers in the Los Angeles area were familiar with the Roberts Linguistic Series (23), its nomenclature was incorporated into the scale. Arbitrary numerical values were chosen for the broad categories (NP, Immature Constructions, Kernel sentences, and Transformations), and the resulting scale was used in order to analyze the spontaneous oral language samples elicited from a group of approximately thirty hearing impaired children in a comparatively large day program in Los Angeles County. The children were video-taped twice annually over a period of three years, January 1967 through May 1969. A written consensus of the speech samples was obtained from small groups of students--members of the teacher preparation class at Cal. State L. A. Each child's spoken language samples were then evaluated in terms of the above-mentioned scale.

Because of the relative linguistic immaturity of the young hearing impaired child, it was decided to view such a scale in terms of structural complexity of the child's <u>response</u> rather than in terms of a sentence--thus the term Structure Complexity of Response Index (SCRI).

A Case Study

Exemplary application of the considerations deemed necessary for evaluation of a hearing impaired child's expressive oral syntactic competence are included in Tables 1, 2, and 3.

Name: H. G.
Born: 10/11/61

Date of Taping:	1/67	6/67	11/67	5/68	11/68	5/69
Chronological Age:	5-3	5-8	6-1	6-7	7-1	7-7
Picture 1						
Time	80"	105"	85"	70"	50"	45"
Utterances	35	30	31	57	52	41
Phrases	25	23	19	20	11	9
No. of Words (Intelligible)	13	11	12	11	32	31
No. of Different Words (Intelligible)	7	9	9	10	19	18
Picture 2						
Time	30"	45"	67"	58"	70"	45"
Utterances	21	12	20	46	83	42
Phrases	14	10	15	17	19	9
No. of Words (Intelligible)	8	6	9	14	22	26
No. of Different Words (Intelligible)	5	5	7	11	12	12
Picture 3						
Time	35"	75"	52"	62"	30"	75"
Utterances	22	12	22	49	43	73
Phrases	16	10	16	15	10	14
No. of Words (Intelligible)	6	3	15	16	12	46
No. of Different Words (Intelligible)	4	3	15	10	11	12

TABLE 1

Name: H. G.
Born: 10/11/61

Date of Taping:	1/67	6/67	11/67	5/68	11/68	5/69
Chronological Age:	5-3	5-8	6-1	6-7	7-1	7-7
Tot. Time	2.25	3.25	3.25	3.2	2.5	2.7
Tot. Utterances	78	54	73	152	178	156
Tot. Phrases	55	43	50	52	40	32
Tot. No. of Words (Intelligible)	27	20	36	41	66	103
Tot. No. of Different Words (Intelligible)	14	12	27	28	28	34

TABLE 2

Interpretation of Table 3 and SCRI:

H.G. was five years, three months at the time of the first taping, and seven years, seven months at the time of the latest taping. His spontaneous speech in response to the stimuli has increased in total utterances, intelligible and unintelligible. His phrase usage has diminished suggesting that he is using more utterances per phrase. He is using more intelligible words and also a greater number of different words which are intelligible, but tends to be using the same words while expanding his sentences. The mean length of response shows consistent expansion, and the syntax of his oral language is becoming more complex.

His use of single open class words gradually decreased as other structures came into use. The phrase structure level is becoming "automatic". He is using more and more kernel sentences. Input language used in his educational program should probably continue to stimulate use of more kernels. Use of the auxiliary is a part of his spontaneous grammar although it is not completely established. He is beginning to use the infinitival complement. Since this structure involves a transformation, he seemingly has reached the transformation level.

NAME: H. G.
BORN: 10-11-61

Date of Taping:	1/67	6/67	11/67	5/68	11/68	5/69
Chronological Age:	5-3	5-8	6-1	6-7	7-1	7-7
Tot. Utterances/Min.	35.4	17.1	22.8	47.5	67.4	57.7
Tot. Phrases/Min.	25	13.4	15.6	16.2	16.0	11.7
Tot. Words/Min. (Intelligible) (Tokens)	12.0	6.2	11.1	12.8	26.4	38.1
Tot. Different Words/Min. (Intelligible) (Types)	6.4	3.7	8.4	8.7	11.2	12.6
Type-Token Ratio	.53	.60	.76	.68	.42	.33
Mean Length of Response	1.0	1.05	1.16	1.8	2.6	5.4
Structural Complexity Response Index	27	20	36	40	87	92

TABLE 3

NAME: H. G.

SCORE	Structure Complexity Response Index	Date Recorded					
		1/67	6/67	11/67	5/68	11/68	5/69
	Child's Chronological Age	5-3	5-8	6-1	6-7	7-1	7-7
1	Open Class	27	18	26	10	5	
	Closed Class						1
	1-Word Stereo				1		1
(Two-Word Combinations Leading To Establishment of NP) 2	Det + N						
	Art + N				2	1	
	Demon + N				1		
	Pos + N				1		
	Number + N						
	N + Number						
	Adj + N		1	3	2		
	N + Adj						
	There + N					1	
	N + There						
	Itsa + N						
	V + N						
	V + Particle						
	N + V (I see)						
	Adv-P						

Score		Date Recorded					
		1/67	6/67	11/67	5/68	11/68	5/69
	Neg + N						
	Conj + N				1	3	1
	2-Word Stereo			2		2	1
3 (Established NP Used Alone)	Art + Adj + N				1		
	Art + Quant + N						
	Art + Quant + Adj + N						
	Pos + Adj + N						
	Pos + Quant + Adj + N						
	(Other)				1	1	
4 (Immature Constructions)	There + NP					2	
	Demon + NP						
	Itsa + NP					1	
	NP + Adj						
	NP + Adv- {P, M, T, F}				1		
	NP + There						
	NP + NP						
	V + Particle + NP						
	V + Particle + Adv- {P, M, T, F}						
	V + NP					2	

SCORE		Date Recorded 1/67	6/67	11/67	5/68	11/68	5/69
	V + Adv- {P, M, T, F}						
	3-Word Stereo						
Kernel Sentences 5	NP + VI						
	NP + VT + NP					2	5
	NP + Vs + Adj						
	NP + Vb + Adj						
	NP + Vb + NP						
	NP + Vmid + NP						
	NP + Be + Adj						
	NP + Be + NP					3	
	NP + Be + Adv-P				1		
	NP + M + ---						
	NP + have + part + ---						
	NP + be + ing + ---						11
	NP + M + have + part + ---						
	NP + M + be + ing + ---						
	NP + have + part + be + ing + ---						
	NP + M + have + part + be + ing + ---						

Score		Date Recorded					
		1/67	6/67	11/67	5/68	11/68	5/69
	Stereo in sentence						
	Contraction in sentence					2	
	Got in sentence						
	(Other					2	
Transformations 6	T-Pos						
	T-Adj						
	T-Comp						
	T-as-as						
	T-Superlative						
	T-Neg						
	T-Yes/No						
	T-Do						
	T-WH, adv-P						
	T-WH, adv-T						
	T-WH, adv-M						
	T-WH, adv-F						
	T-WH, NP						
	T-Infin. Comp						1
	T-Reassertion						
	T-Conj.						
	T-Conj., deletion						
	T-There						
	T-Passive						

Score	Date Recorded					
	1/67	6/67	11/67	5/68	11/68	5/69
T-Relative						
T-Relative, Preposition						
T-Relative, Nonrestrictive						
T-Relative, Deletion						
T-Noun Modifier						
T-Sentence Modifier						
T-Subordinate Clause						
T-Subordinate Clause						
T-Subordinate Clause, It						
T-Relative, possessive						
T-Relative, of which						
T-Deletion for subordinate and relative clauses						
T-Nominative Absolute						
T-For-To						
T-For-to deletion						
T-in order to						
T-in order to, deletion						
T-sentence connector						
T-sentence connector, Transposition						
T-Verb Transitive						
TOTAL	27	20	36	40	87	92

SUMMARY

If a teacher is concerned with the development and modification of the hearing impaired child's expressive oral syntactic competence, he must have a good understanding of the structure of language, and knowledge of the developmental sequence of language acquisition. The variables considered important in that evaluation are choice of stimuli, procedure for the presentation of those stimuli, the method of recording, the qualifications of the observer-recorders, the length and duration of that response, the record of the utterances, pauses, tokens and types of words used, the type-token ratio, the mean length (MLR) and the structure complexity of response (SCRI).

A case study of the evaluative variables is presented.

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SUMMARY

If a teacher is concerned with the development and modification of the hearing impaired child's expressive oral syntactic competence, he must have a good understanding of the structure of language, and knowledge of the developmental sequence of language acquisition. The variables considered important in that evaluation are choice of stimuli, procedure for the presentation of those stimuli, the method of recording, the qualifications of the observer-recorders, the length and duration of that response, the record of the utterances, pauses, tokens and types of words used, the type-token ratio, the mean length (MLR) and the structure complexity of response (SCRI).

A case study of the evaluative variables is presented.

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LANGUAGE OF CHILDREN RECEIVING AURAL LINGUISTIC INPUT

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Language has traditionally been of major interest and concern to persons working with hearing impaired children, and it continues to be. In former years we probably would have focused our attention on the amount and kind of vocabulary, the number and kinds of sentences, the variety of words and the length of sentences. Categories of adult grammar were used to describe children's language based on the assumption that the child's language was adult language.

Information which has come from the linguists and the psycholinguists in the last decade has contributed a great deal to our knowledge and understanding of language acquisition. It has led us to attempt some different approaches and procedures in teaching and describing language. As the previous speaker stated, at Central Institute we are greatly influenced by the belief that every child, even a hearing impaired child, has the innate capacity for acquiring language. A child with normal hearing does not produce only sentences which he has heard, but generates his own novel set of sentences at the age of three or four. This fact seems to be evidence that imitation alone does not account for the phenomenon of language acquisition.

It is important that a distinction be made between linguistic competence and linguistic performance at this point. The difference between competence and performance is what a person knows about a language as opposed to his ability to express this knowledge in talking and listening. Performance operates under constraints of memory and time, whereas such limitations are irrelevant to competence. Precision in the description and measurement of competence as distinguished from performance still eludes us. Therefore, we are forced to make our judgements on the child's linguistic performance.

The empirical evidence which I would like to present is limited to spoken linguistic performance. Over a period of years we have been recording periodic samples of spontaneous language performance of children enrolled at Central Institute for the Deaf. We show each child a series of pictures and he is asked to talk about them.

Before we go into the evidence, let us review briefly what went into the teaching of our hearing impaired children. All children become conceptualized beings before they become verbalized beings.

We know that concept formation, regardless of level, stems from experience, either direct or vicarious. We believe that language based on experience is useful, meaningful and critical to a child. The children must be involved in their language development. In the pre-primary and early primary classes, our program is oriented to daily experiences, either appropriately contrived or spontaneous. Most of the experiences are at the sensori-motor level. Appropriate language accompanies and follows an experience. Some of the language drawn from such experiences is put into written form with accompanying pictures.

The upper primary classes are at the advanced perceptual level whereby they can benefit from pictures. Therefore, vicarious experiences are used for the chart stories in these classes. Having the language presented in written form enables the children to see the words, particularly the phonemes and the function words such as prepositions, conjunctions, etc. which have low acoustic power and poor visibility in lipreading. The children follow the written form while listening to the auditory pattern. The stories do not follow the more traditional approach of systematic teaching of structural forms. The language used is at a higher level than the children's own spontaneous language. The sentences vary a great deal in length, type and in language structure. There is a great deal of variety in intonation patterns. Over a period of time the same vocabulary and grammatical constructs have been used frequently in a variety of ways. We are trying to provide the children with enough examples of language constructs so they will have ample opportunity to develop the grammatical rules inductively.

I would like to dwell upon the growth in language output which we have observed in the recordings mentioned earlier. There seems to be a rather ordered sequence of development although the rate of progression varies from child to child. For the purposes of this discussion, I have singled out one typical child for careful consideration.

The linguistic samples which you are going to hear represent spontaneous performance. The utterances were in response to a picture stimulus which showed a picture of a boy and a girl building "a castle" with kitchen pans. The child was asked to talk about the picture. The language utterances were recorded and transcribed periodically.

The first sample of Philip's spontaneous language was recorded at the age of five years ten months. This was during his first

year at CID. Previously he had been enrolled in a pre-school program elsewhere.

His intonation has syntactic form; there is a rise and fall in his voice. He obviously is performing at the first linguistic stage which we feel to be that of intonation. He is also attempting the next stage which seems to be labeling. He even is attempting some lexical words. As you listen you may be able to sense the beginning of phrase structure grammar.

(PLAY TAPE)

The next sample was recorded when Philip was seven years two months of age. Intonation for sentences with vocabulary is now apparent. Syntactic form is present although it is not very complex. You will note that the present progressive tense as demonstrated by the morpheme "ing" is used throughout. It is particularly interesting to note this use because in his training thus far with the experience stories described earlier, Philip had been exposed to past tense morphemes only.

(PLAY TAPE)

At the age of seven years ten months, Philip is using the function word "is" appropriately with the progressive tense morpheme "ing". The future negative is used with no effort on his part. He apparently has developed the correct meaning for the functor "still" because this picture hasn't changed since he saw it the last time! He evidences some difficulty with word order. He corrects himself on the appropriate auxiliary and changes from "the pan will" to "the pan might". However, grammatically he uses the wrong form of the verb. He uses causality and the appropriate function words "so" and "because". He uses the intensifier "very" and is beginning to use other determiners such as "another".

(PLAY TAPE)

The last sample which I am going to play today was recorded one year later. Philip seems to have control of the plural morpheme or inflection since he correctly used "the pans" meaning something different from "the red pan". He is shifting to the appropriate form of the auxiliary. Note the complexity, variety of transformations and length of the sentences. He is quite confident with causal clauses and direct discourse. While he has matured beyond the interest level of the picture, he is being creative about the picture rather than merely describing it.

(PLAY TAPE)

It should be noted that Philip's achievement scores on the Gates-MacGinitie Reading Test were 2.8 for vocabulary and 3.6 for comprehension at the time the last language sample was recorded. This does not seem to be in agreement with his language performance.

Now let us look at a somewhat different dimension of the language of these children receiving the aural linguistic input. A year ago one of our graduate students, Laubscher (4), did an independent study on hearing impaired children from CID ranging in age from five years three months to nine years seven months. She used the spontaneous language samples such as those of Philip elicited from the picture you saw previously. We found the results of her study most interesting and I would like to share some of them with you.

Her goal was to determine whether there were developmental trends of certain language features and formulistic rules present in the language of these hearing impaired children. As the previous speakers have mentioned, language development of children with normal hearing indicates that certain language features are acquired before others and show improvement as a function of age.

Among the things the student investigated with these children was verb tenses and verb inflections. The analysis of the use of verb tenses and verb forms indicated similarity with normal hearing children as described by Cazden (2) and Berko (1). The present tense occurred earliest in the children's language samples and was used in all samples when verbs were present. The present progressive and the past tense of irregular verbs appeared second and third respectively. As age increased, the present tense was used less frequently. As was demonstrated in Philip's tape, the present progressive tense occurred most frequently. The past tense occurred after the present progressive and the past progressive was the last to appear.

These children had been exposed to all the verb tenses and inflections. Verb tenses or inflections were not taught per se, but whatever form seemed appropriate was used. In general, at least in terms of the chart stories, they had had more exposure to the past tense of both regular and irregular verbs than to the other three tenses mentioned above. As I indicated earlier, hearing impaired children are able to induce the principles and generate the appropriate language when they are given enough linguistic information.

Laubscher found that the use of determiners when they were required increased with age. There were very few omissions at ages eight and nine. "The" and "a" were the first ones used by all the children. They began to use definite determiners such as "this" and "that", "some", "another" and "all", numerical determiners and possessives. The latter two were present in Philip's third tape. Menyuk (4) found that children at the age of three years eight months omit more articles than children at the age of five years eight months. At the latter age she found very few omissions.

In Laubscher's study, the occurrence of conjunctions indicated the use of various rules. Different levels of complexity in the use of conjunctions were found as age increased. The conjunction "and" occurred most frequently. It was often used to string many nouns together in a sentence. Some children started their sentences with "and", and it frequently occurred after a pause in the utterance. However, "so", "but" and "because" also occurred as was noted in the sample to which you listened. Connecting two kernel sentences with "and" increased rapidly and dominated all language samples at ages seven, eight and nine. Conjunctions were among the earliest acquired transformations. These results were similar to those reported by Menyuk (4).

Philip demonstrated some use of the correct plural morpheme in his last tape, and the children in the study also showed a slight increase with age in the use of the plural inflection, but it was inconsistent. Laubscher found no complete mastery of this inflection in any of the language samples. In many of the samples, omission of the plural inflection used concurrently with the application of the plural inflection occurred in the following manner. When the child used a plural determiner such as a number before a noun, the plural inflection was omitted. When no plural determiner was used before the noun, the noun was pluralized; i.e. ten pan .....pans or the pans. This observation may reflect the teaching of numbers as nouns rather than as adjectives or determiners, or it may simply mean that the child did not hear or attend to the phoneme"s". However, the latter seems less likely since they did demonstrate use of the phoneme without numbers.

The children's early syntactic development was demonstrated by the appearance first of intonation, then simple labeling with single words, next telegraphic speech followed by kernel sentences. The use of kernel sentences increased as the children became older.

There was also a rapid increase in the use of transformations concurrently with kernel sentences. These results are also in accord with normal language development.

Of the six transformations examined by Laubscher, pronouns and conjunctions were used most frequently and occurred at the earliest ages. Very few errors occurred in the transformation, Pronoun, and there was an increase in the different kinds of pronouns used by all the children as they became older.

We feel that the hearing impaired children who are receiving an aural linguistic input are acquiring language in stages which parallel children with normal hearing. The main difference is the chronological age at which the grammatical structures emerge. Their language does not reflect rote performances or memorized strings of words, but rather an ability to induce linguistic rules or principles. Hearing impaired children can also generate their own novel sets of sentences as do hearing children. Our findings seem to support Lenneberg's observation that deaf children could hardly differ from hearing children in the capacity for acquiring language provided they were given enough examples and allowed to go through a natural order of grammatical development. Judged by their performance, we can postulate that the linguistic competence of hearing impaired children proceeds through normal stages of growth.

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A Linguistic Approach to Teaching Hearing Impaired Children

Implications for the Classroom Teacher

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I intend to first present briefly the basic philosophy upon which our approach to teaching language is based. I will then discuss four principles involved in this teaching. This will be followed by a description of the application of these principles to a teaching situation. Finally, I will discuss the use of repetition and variety in subsequent language teaching.

BASIC ASSUMPTIONS

Our approach to teaching language to hearing impaired children rests on two basic beliefs. The first concerns the nature of human beings. We agree with the linguists who say that the human mind is endowed with a unique ability to learn language. We, too, believe that somehow the human mind is able to take in that whole confusing mess we call "language" and to make sense out of it. As the language principles are sorted out, the system is learned. This capacity for learning language is possessed by all human beings regardless of their hearing ability. Therefore, hearing impaired children also have this capacity for deciphering the language code if they are presented with enough meaningful language samples, beginning with simple forms and gradually progressing to more complex

language. Part of our teaching procedure at Central Institute for the Deaf is to provide many samples of language to these children.

The second assumption we make concerns the nature of language. Because language is so complex, we believe it must be dealt with as a whole from the very beginning. We could begin by teaching only one aspect of the language, let us say phonology. We could have the child concentrate on the sounds of the language, the individual phonemes, and then build up words, phoneme by phoneme, and go on to build up sentences word by word. etc. In this way the child could gradually build the language bit by bit, moving from the simpler part to the more complex whole. At first this may seem an advantageous way to approach language learning. However, the nature of language,precisely because it is so complex, must be dealt with as a whole.

It is easier for the child to tackle the whole complexity called "LANGUAGE" and decipher it, than to study the various aspects separately and attempt to put the parts together to artificially create language. It is only in relation to the whole that the various aspects of language have meaning. The purpose of language is to express ideas, desires, needs. Usually the effect is getting someone to react to this expression. Therefore, from the beginning we deal with language as a whole and use language for the purpose of communicating. We teach the child what language is, what it can do for him, how he can use it to manipulate his environment.

PRINCIPLES OF TEACHING TECHNIQUES

1) GETTING THE CHILD TUNED IN TO THE COMMUNICATION ACT

The first step in teaching language to hearing impaired children is to get the child tuned in to the communication act. The child must be taught to watch the speaker's lips. He must be taught to use whatever hearing he has to listen to the auditory pattern of the speaker. When he has learned to listen and look, then he can be taught to imitate the speaker's speech pattern. However, because listening, looking and imitating are closely interrelated parts of the total communication act, they need not be taught separetely. Usually they are learned almost simultaneously or at least evidence of learning is given simultaneously.

2) GETTING THE TEACHER TUNED IN TO THE CHILD

Getting the child tuned in to the communication act is greatly dependent on getting the teacher tuned in to the child and what the child desires to communicate. These two are so closely related that it is difficult to determine which comes first. It is probably only when both are operating simultaneously that the child really understands what language is all about, what purpose communication serves.

All children have a desire to communicate and it is up to the teacher to find out what the child wishes to say and put language to it. The teacher must determine in any way she can what the child may want to communicate about and then supply the language for that

idea or for that need.

3) EXPANSION AND IMITATION

When the child attempts to communicate something, the teacher figures out what he is trying to say and then gives him the language to say it. In this way the teacher expands the child's communication attempt into grammatical language. The child is required to imitate the pattern at whatever level he is capable. The expansion helps to provide the child with the variety of language essential to his being able to induce language principles. The expansion also exposes the child to a level of language above the level he is using. In this way the child is moved from less complex to more complex as well as being given flexibility in his use of language. The imitation provides assurance to the teacher and reinforcement to the child. Imitation forces the language presented "through" the child and greatly increases the chances of that language being absorbed in some way by the child. The child, using the information gained from the expansion-imitation procedures, is somehow eventually able to abstract the structural language principles necessary to understanding language and necessary to being capable of creating new language.

4) TEACHING MATERIALS DERIVED FROM THE ABOVE

The teacher gets the child tuned in to the communication act by attaching language to what the child wants to say. Then the teacher gets the child to imitate the speech pattern for what he wanted to say. Some of this language can then be put into written form and

used as material for language lessons providing the necessary repetition for learning language. This written language can take many forms, two of which are experience chart stories and single sentence cards. (SHOW SAMPLES) Sometimes the language is derived from contrived experiences and sometimes it grows out of incidental happenings in the classroom. Sometimes it is language that the children use for social interaction and sometimes it is the language of games. Sometimes it relates to art or science activities and sometimes to various kinds of dramatic play. In all cases it is based on experiences that are real and meaningful to the children.

I have briefly described four principles underlying our teaching procedure. The methods of applying these principles to a specific teaching situation are determined by the child's age, the child's ability and the child's level of language competence at the time. Consider the following hypothetical situation of a beginning child in our program as an example of a possible application of the four principles just discussed.

Situation: Milk and cookies are being served.

Child: Four years old - does not watch the speaker's lips, does not vocalize and gives no indication of hearing the speaker's voice.
(The child is not tuned in to the communication act.)

Teacher: Is pouring milk.

Possible approach: Teacher has pitcher of milk and child indicates he wants some. He may gesture or scream

> or use any means at his disposal to indicate to Teacher that he wants some milk. T. waits until child's eyes focus on T's face. They will eventually because he will be looking for some indication of whether or not he is going to get what he wants. At that moment T. must be ready to give him the language "Milk" or "I want some milk" or "Give me some milk". Then T. must attempt to get the child to imitate this language at whatever level he is capable. Later T. can write on a card "Johnny drank some milk" or"Johnny wanted more milk" or "Johnny likes milk", etc.

All of this probably will not happen the first time milk and cookies are served. Getting these procedures established often takes weeks, even months, but let us analyze what is actually happening. First the teacher is creating a situation (milk is being served) in which the child has a desire to communicate and the teacher is tuned in to what the child wants to communicate (that he wants milk). The teacher uses this situation to force the child to tune in to the communication act. She makes it worth the child's while to tune in. Watching the speaker's lips, listening to the pattern and attempting to imitate the pattern benefits the child. It gets him what he wants. He gets the milk. Not only does it get him what he wants but it becomes the only way he can get what he wants. The teacher sees to it that other means of communication cease to be effective for him. The written form reinforces his learning. He is interested in it because it is language he understands and language which he uses or wants to use.

At first just getting the child's eyes to focus on the speaker's lips may be a sufficient accomplishment. Soon he will learn that his eyes must look at the lips before the teacher will pour the milk. The task can be accomplished more quickly if the teacher pours small amounts of milk so that in a single snack period there are several opportunities to reinforce the act of watching the teacher's lips. Every time the teacher passes things out to the children, this procedure can be repeated. The teacher must arrange many opportunities to reinforce this idea. As soon as possible the teacher must try to get the child to imitate the verbal pattern. Gradually the teacher will move the child towards closer and closer approximation of the language pattern given.

If food is not an area in which the teacher is receiving a satisfactory response for a particular child, then the teacher must find a more meaningful situation. Teacher may have a child who does not like milk or cookies or eats a big breakfast and isn't interested in food at school. All is not lost for such a child. The teacher must be inventive and creative in finding a way to the child. The child may appear to be interested in absolutely nothing. The teacher must observe this child closely. He will give himself away. He may like to swing and the teacher can get him to say "Push me." If he likes to draw, the teacher can get him to say "Paper" or "I want some paper." If he likes to jump, get him to say "Jump" or "I like to jump" or "Let me jump" before letting him jump off a chair or over a block.

If he likes to play catch, he can say "Ball" or "Throw the ball". Somehow the teacher must find the way to get to the child. The teacher must get tuned in to something the child wants to say if she hopes to get the child tuned in to the communication act.

Once the general idea of a communication act is put across, the teaching of new language becomes much easier. Once the child understands what language is all about and is able to participate in the imitation and expansion procedures described above, he has begun to learn language. This is just the beginning. It then becomes the task of the teacher to decide what new language the child is ready for and when he is ready and then to put that language to the child's ideas.

SUBSEQUENT LANGUAGE TEACHING

At this stage there are two essentials - repetition and variety. The written materials such as charts and sentence cards provide one kind of repetition, the repetition of particular sentences such as in the sentence card "Lisa wanted more milk". The child can practice this particular sentence over a period of time and such practice provides one kind of repetition.

For this kind of repetition the teacher might use an experience chart story. One method might be as follows:

T. gives one of the sentences of the story.

"Eric put 2 feathers on his hat."

The child finds the sentence and says it, usually using only the key message carrying words, possibly because they are words of greater acoustic power.

"Eric feathers hat."

The teacher breaks the sentence into smaller units so that the child is able to say all parts including the function words which are likely to have been omitted in the first imitation.

"Eric put 2 feathers on his hat."

"Eric put 2 feathers on his hat."

In breaking the sentence, thought units should be kept together, but the length of the unit will depend on the ability of the child. The teacher can break the sentence into units as small as is necessary in order to get all the parts processed.

Then the teacher repeats the whole sentence again so that the child is exposed to the whole sentence as well as to its separate parts.

With increased practice more and more of the sentence is included in the child's productions.

In this way the child gradually becomes aware of all the words necessary to express his idea accurately. As the child becomes aware of these smaller words, which generally are of low acoustic power, he has the opportunity of learning their importance to the meaning of the sentence and gradually begins using them appropriately when creating sentences of his own.

In addition the teacher sees to it that vocabulary and syntactical structures get repeated from day to day in a variety of sentences. She

does this through the language she attaches to contrived situations, to incidental happenings, to all activities in the classroom.

For instance, on Monday Teacher may present:

"After Eric tied his shoes, he went to gym"

and on Tuesday

"After we finished our snack, we went out to play."

and on Wednesday

"After David poured the lemonade, Beth passed around the cookies."

All are examples of the same syntactical structure being repeated from day to day over a period of time.

New vocabulary and expressions get repeated from day to day in much the same way and by the same conscious effort on the part of the teacher. For example:

"It's almost time for recess."

"The cup is almost full."

"We are almost finished."

Equally important as repetition is variety. The teacher consciously attempts to provide variety both in vocabulary and in syntactical structure. The variety that is provided is spread over time from day to day, from week to week, and from month to month. The teacher consciously provides a number of kinds of variety.

1) Each noun should be used with a variety of verbs.

e.g. Lisa bounced the ball.
Lisa threw the ball.
Lisa kicked the ball.

Lisa caught the ball.
Lisa rolled the ball.
Lisa found the ball.
etc.

2) Each verb should be used with a variety of subjects and objects.

e.g. The boy opened the door.
The girl opened her letter.
David opened the window.
Robin opened her present.
The children opened their lockers.
etc.

3) The syntactical structure of the sentences should be varied.

e.g. Throw the ball.
Scott threw the ball.
The ball was thrown high.
The boy can throw fast.
Katherine likes to throw.
Throwing balls is fun.
If you throw the ball, I'll catch it.
After he threw the ball, he fell.
etc.

4) A variety of verb forms should be used.

e.g. He throws.
He is throwing.
He can throw.
He threw.
He was throwing.
He has thrown.
He could have thrown.
He had been throwing.
He could have been throwing.
etc.

The teacher does not attempt to fully teach one noun, verb or syntactical structure in a variety of ways before moving to another.

For example, she does not teach bounce the ball, kick the ball, throw the ball, etc. before introducing some other noun. However, once the child knows "ball", she attempts in the following weeks to find or to make occasions to use "ball" with a variety of verbs. During the same period of time she will also attempt to find a variety of nouns to be used with the variety of verbs - throw, kick, roll, etc. She uses familiar nouns with unfamiliar verbs and familiar verbs with unfamiliar nouns and familiar vocabulary when introducing new syntactical structures.

In the beginning the teacher uses simple sentence structures and as the children gain competence she moves to more complex language. As the teacher expands the simple sentences to more complex language another kind of variety is apparent. The teacher provides a variety of ways to express the same idea.

Example: If the child says "It is warm. I did not wear a coat." (two simple sentences), the teacher will give more complex language for the same idea. She might say any of the following:

"It was so warm that Eric did not need a coat."

"It was warm enough to go without a coat."

"Robin wore a sweater instead of a coat because it was warm."

"When it is warm, we do not need to wear coats."

"It was too warm to wear a coat."

"It was warm so David went outside without a coat."

"Since it was warm, Lisa did not need a coat."

If the child spontaneously expresses the idea one way, the teacher rephrases the sentence. In this way, the child learns there are many ways of expressing the same idea. The teacher consciously tries to move the child to the next level of language competence. New syntactical structures are used to express his idea and these new syntactical structures are being used with familiar vocabulary.

The teacher is aware of the wide variety of language that must be presented. She is also cognizant of the fact that this variety must be presented over a long period of time ---weeks, months, even years.

This variety of language gets presented throughout the days and weeks when talking to the children, when rephrasing the language of the children, when attaching language to the children's ideas, when developing experience stories, when telling stories, when playing games, when carrying on all class activities.

Both variety and repetition are essential to teaching language. The variety is necessary in order to provide the opportunity for

inducing the language principles and the repetition is necessary to insure learning.

The procedures described earlier continue to be applied to all subsequent language learning. The teacher continues to put language to what the child wants to say and continues to expand and to put into grammatical form what the child actually says. The child imitates the teacher's pattern. The teacher contrives a variety of situations in order to create a need for a variety of language and for repetition of language. A great deal of this language gets put into written form and becomes the material of more formal language lessons.

In addition, language is also presented through stories, books, action rhymes, games, pictures, film strips, etc. The techniques and materials that can be used for teaching language are limitless. However, the basic principles described apply to all language teaching regardless of the specific materials used. The materials are the surface, the media which give form to the basic principles.

SUMMARY

Our approach to teaching language is based on the concept that language must be encountered as a complex whole from the very beginning. This is an advantageous way for human beings to approach the study of language because they have an innate capacity for dealing

with the whole complexity of language and somehow deciphering the language code. I have tried to show how four principles of teaching can be applied to a particular beginning teaching situation. The four principles involved were:

1) Getting the child tuned in to the language act.

2) Getting the teacher tuned in to the child's communication desires.

3) The technique of imitation and expansion.

4) Deriving language lesson materials from meaningful experiences of the child and using the child's communication attempts as the basis of the language to be taught.

I have also pointed out the necessity of both repetition and variety in the language being presented. Variety is necessary in vocabulary, word forms and syntactical structures in order to provide opportunity for inducing language principles and to provide for flexibility of language. Repetition is necessary in order to insure learning. These are some of the principles involved in our approach to teaching language to young hearing impaired children at Central Institute for the Deaf.